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### Dangers of Steam Navigation in the West

The United States Commissioner, B. F. Hickman, at St. Louis, after a most patient hearing of the charges made against I. A. Bruner, Capt. of the "Kate Kearney," has held him to bail in the sum of $5,000, to answer the charge of carelessness and inattention in his duties as Captain. It seems that the boiler leaked badly on the day before the explosion.

The following extract is from the St. Louis "Intelligencer;" we bespeak for it the attentive consideration of all our readers: "We learn from the testimony taken in this remarkable case of the 'Kate Kearney,' that the common manner of stopping leaks in steamboat boilers is to throw in them horse dung, ropes chopped fine, potatoes, meal, &c. Sometimes lead is melted and poured in the holes, and sometimes wooden pegs answer the purpose!

One other startling fact has been elicited by this examination. It is that the hydrostatic pressure, the test of the strength of boilers prescribed by the steamboat law, cannot be relied on at all to prove the tenacity or security of boiler iron. It was proved that the 'Kearney' boilers bore, some months ago, a pressure by this test of 190 pounds to the inch, 110 being her working limit by law, and yet it was shown on trial that the exploded boiler had a grain like pot-metal, and was brittle, and would fly to pieces under the blows of a hammer.

On the whole, we are free to say that never had we any conception of the real perils of steamboat navigation in the West, until we saw this evidence, so carefully taken by Commissioner Hickman. It covers about one hundred and forty pages of manuscript, and furnishes a mass of information on the subjects embraced, that will startle and astound the country when it becomes known."

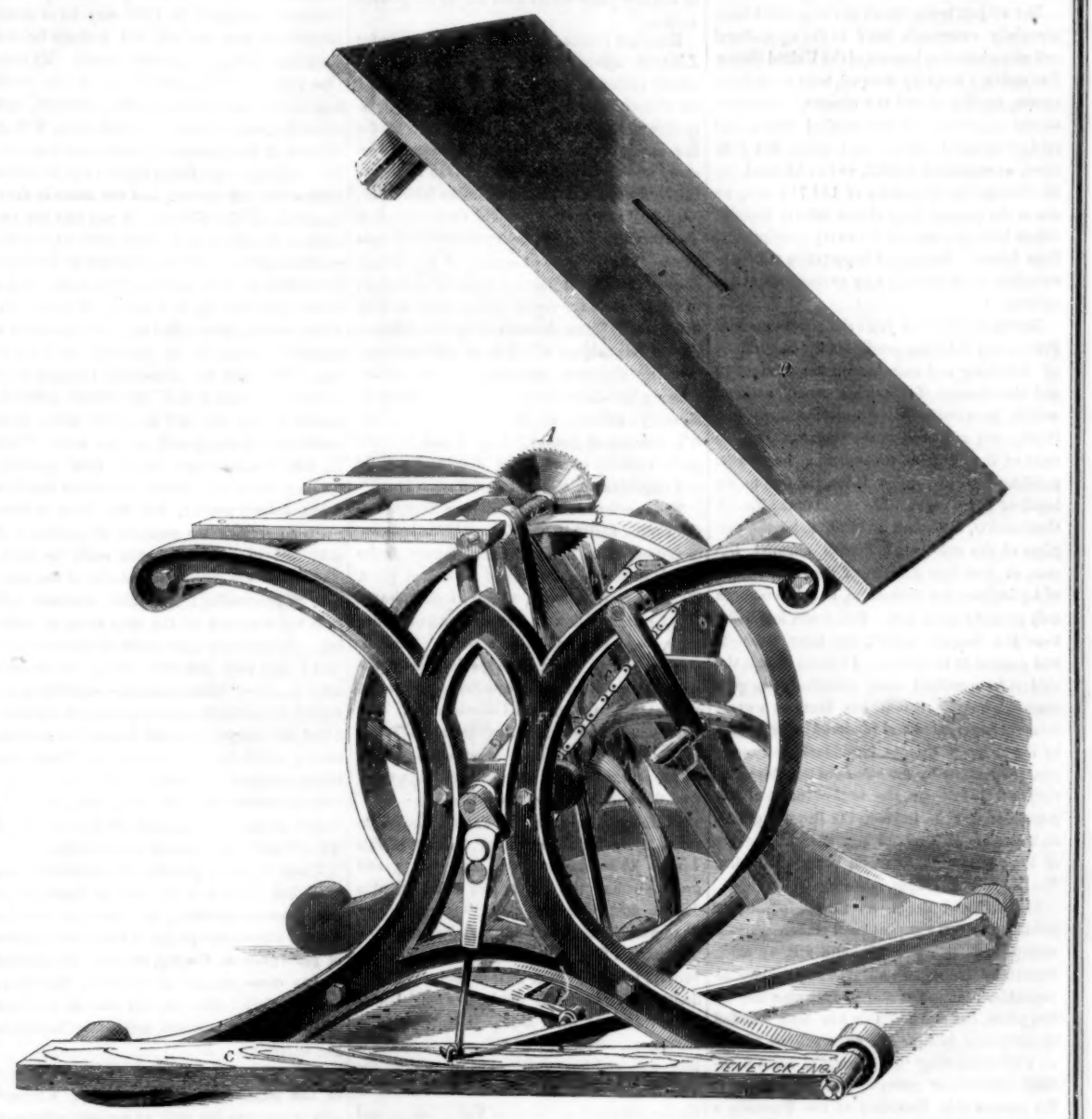
[We hope this testimony will be published. We were always afraid of the hydraulic not being a true test, because it exerts an equal pressure, and that a gradual one, not suddenly generated, upon all parts of the boiler; while on the other hand, the sudden generation of steam, or its sudden transfer from static to dynamic pressure, is like the blow of a hammer striking on the weakest part of the boiler. If the hydraulic test pumps, however, were large and powerful, they could be worked to produce the same effect, but no such pumps are constructed at present. In the working of fire-engines, every fireman knows that hose can be used safely with a high pressure, if that pressure is slowly and gradually brought up to its limit, while they will burst if the pressure is suddenly generated by the rapid working of the pumps.

### What is Virtue?

A student put this question to the late Archibald Alexander. His simple and admirable reply was. "Virtue consists in doing our duty, in the several relations that we sustain in respect to ourselves, to our fellow men, and to God, as known from reason, conscience and revelation."

A new palace has been uncovered in the ruins of Nineveh—a palace whose beauty excels any yet found in Assyria.

## DRIVING CIRCULAR SAWS.




This engraving is a perspective view of a portable circular saw, driven by Dexter H. Chamberlain's patent plan of driving the same.

A is a circular saw; B is the driving wheel. The arbor or spindle of the saw is covered with washers of leather, *a*, and rests upon the periphery of the driving wheel. The leather washers are confined between a collar near the saw, and a nut (which also performs the office of a pulley) on the end of the spindle. Beneath the large driving wheel, B, and opposite to the saw spindle is a pulley, E, in contact below with the periphery of the driving wheel. The surface of this pulley is also covered with leather. Near each end of this pulley there is an endless belt, *b*, which passes up and around the pulleys near each end of the saw spindle; F is the frame. The shaft of the driving wheel is propelled by the treddle, C, or crank handle; if by the former, the wheel of chain *c*, is disconnected from the driving shaft; D is the table.

The effect of this combination for operating the saw, is, that while the tension of the belts transmit the requisite power to drive the saw, the friction upon the journals of the saw and shaft of the driving wheel, is less than by other methods of producing pressure by weights, springs, and familiar contrivances. This is observable at a glance.

More information may be obtained by letter addressed to Messrs. Hatch & Hastings, No. 38 Water street, Boston, Mass.

### Painted Sculptures.

The effect produced by painting specimens of sculpture is a question which is mooted among artists of the present day. The ill effects, it is said, have been strikingly illustrated in the Crystal Palace at Sydenham. A portion of the Crystal Palace frieze of the Parthenon has (so says a writer in "Chamber's Journal,") been painted blue and in strong shadows; another portion cream color, and a third left in the natural hue of the plaster. The result may be imagined. The cream color was a bad imitation of the marble, and the blue was an outrage upon ancient Greece. The paint killed all the delicate effects and beautiful developments to which the high cut basso-relievo attains. The chiaroscuro destroyed the spirit of the work; and "if ever there was a standing emphatic protest against the utter inapplicability of color, which is the element and spirit of one art, to give the element and spirit of another—it is to be daily seen in the Crystal Palace."

### Properties of Iron.

In the concluding lecture of Professor Smith at the Smithsonian Institution, the lecturer dwelt upon the tendency of iron to undergo a change from a fibrous to a granular condition—thus causing the abstraction of an indefinite amount of its tenacity and strength. Fibrous iron, by being for a considerable time subjected to concussion, will become granular, and therefore weak. A knowledge of this principle has induced the French Government to disallow the use of iron axles on their *dilligences* beyond a certain time; they must then be removed. Iron cannon, originally very strong, become weaker and weaker by use, from the loosening of their texture.

### Mildew and Gooseberries.

Sam. Edwards, of La Mobile, Ill., states that for several years his gooseberry bushes were affected by mildew. Last year he gave them a very severe pruning, mulched with coarse hay, topped-dressed the soil with well-rotted barn-yard manure, salt and leached ashes, and he has no mildew.

### Telegraph to Ireland.

It is currently reported that a company of leading capitalists in this city have obtained a grant from the authorities of Newfoundland, of fifty square miles of land, and a bonus of £50,000, if they will establish a line of submarine telegraph between that Island and Ireland.—We hope this is true.

### Flax Industry---No. 1.

In the present number of the "Scientific American," we commence the publication of a series of articles on the subject of the culture and production of flax, the manufacture of linen, and the commercial and economic relations which this great branch of industry at present maintains in respect to other sources of wealth, both in Europe and the United States. Notice will also be taken of the cortical fibers used for manufacturing purposes, and of the various foliaceous fibers known to commerce under the name of "Sisal and Manilla Hemp," "Gunny" fiber, "China Grass," "New Zealand Flax," &c.

The subject is one which at this present time, especially commends itself to the agricultural and manufacturing interest of the United States. Possessing a territory unequal, both as regards extent, fertility of soil and climate, for the successful cultivation of the cortical fibers, and raising annually, for the seed alone, flax sufficient, as estimated in 1852, to furnish marketable fiber to the community of 169,750 tuns, we are at the present time almost wholly dependent on foreign countries for every description of linen fabrics; the annual importation and consumption of which will now average about ten millions.

During the last few years the governments of France and Belgium, sensible of the importance of cherishing and encouraging the production and manufacture of flax as a source of national wealth, have instituted separate commissions to inquire and report upon the subject. The results of the Belgian Commission, have been published in two large folios, of five to six hundred pages each. The report of the French Commission, instituted in 1850, under the auspices of the celebrated French chemist, Dumas, at that time Minister of the Department of Agriculture and Commerce, has thus far been only partially published. It is much less bulky than the Belgian report, but more elaborate and general in its details. In Great Britain the subject has received much attention from government, but its action has been in a great measure superseded and rendered unnecessary by the action of private individuals and societies, particularly by the efforts of the Royal Society of Belfast for the improvement of the growth of flax in Ireland, the Royal Agricultural Society of Scotland, and the publications of Messrs. Sproule, Dickson, Warner, Higgins, Drs. Kane and Hodges, and others.

In the United States no similar efforts, or publications have as yet been made. Private enterprise is doing much, and will, we trust, eventually accomplish all that is necessary or desirable. Some newspaper discussion has taken place, but much of this has been founded on erroneous data, or has been written with a view of subserving the interest of some particular machine or process. At the request of the present able Secretary of the Treasury, a report "On the subject of the flax industry and its relations to the United States," is now in preparation under the supervision of the writer of these articles, which will be transmitted to Congress. What is now wanted and imperatively demanded is, that true and reliable information shall be laid before the public, showing the importance and the value of the flax industry; then, when these facts shall become apparent to the capitalist, the artisan, and the agriculturist, the business will take care of itself, and become systematized to the same extent that it now is in nearly every country of Europe. With these prefatory observations, we enter upon the discussion of our subject.

FLAX—*Linum*—This variety of annual plants—class *pentandria*; order *pentaginia*, has been withdrawn from the order *caryophyllaceæ* (pink family) by De Candolle and other modern botanists, to form a new order, viz., that of *Linaceæ*.

The botanical characteristics which distinguish this order, are as follows:—Herbs, with entire and sessile leaves, either alternate, opposite, or verticillate, and no stippules, except minute glands occasionally. Flowers regular and symmetrical; calyx of three or five persistent sepals, strongly imbricated, petals as many as the sepals, convolute in restivation; stamens as many as the petals, and usually with as many intermediate teeth, representing an abortive series, all united at the base into a ring; hypogynous, ovary with as many styles and cells as there are sepals, each cell with two suspended ovules; the cells in the capsule each more or less perfectly divided into two by a false partition which grows from the back (dorsal suture); the spurious cells one-seeded, embryo straight, cotyledons flat, fleshy, and oily, surrounded by a thin albuminous membrane.—GRAY.

The color of the flower of the flax plant is generally blue; some varieties, however, produce yellow or white flowers. The stalk is woody, with a grayish-colored bark; the hight of the flax plant varies from ten to forty-seven inches.

Botanists reckon, as belonging to the order *Linaceæ*, upwards of ninety distinct species, mostly natives of the temperate zones; of these the French botanist, Planchon, describes eighty-three; Engleman, in a monograph of the flax family of the Southern and Western Territory of the United States, included in one of the publications of the Smithsonian Institution, describes nine species; one of these was first discovered growing on the battle-field of Buena Vista. The number of species of flax indigenous to the United States is believed to be ten; to Canada, and the region north, two; to Mexico, seven. Those desirous of further information on this subject will find an elaborate memoir, by Planchon, accompanied by a chart, showing the distribution of the flax family in in every portion of the globe, in "Hooker's Journal of Botany," Vols. 6 and 7. The great majority of all these species are wild and uncultivated, and yield indifferent fiber.

The species of flax best known in Europe and the United States, is the *Linum Usitatissimum*, or ordinary flax. The botanical characteristics of this species are as follows: an annual plant, hight of stalk from ten to forty inches, leaves few, lanceolate, flowers terminal, and of a blue color, ovary terminating in a point. There is another variety of the same species, which presents much the same characteristics, and is also cultivated as the *Linum Usitatissimum*. The flowers are, however, white, instead of blue, and the plant is somewhat larger, more productive and hardy, and grows more vigorously than the ordinary blue-flowered flax.

In Holland, Belgium, and France, the cultivators recognize three distinct varieties of this *Linum Usitatissimum*, viz., 1st. "*Le grand lin*,"—yielding the nicest and most valuable fibers. 2nd. "*Le lin chaud*,"—producing a large quantity of seed. 3d. "*Le lin moyen*,"—producing a fiber of ordinary quality. The first variety, le grand lin, or as it is also sometimes designated, "*lin froid*," produces a long slender stalk, with very little seed. It ripens late in the season. The fiber of this variety of flax is long, fine, and has superior qualities; it is the only variety of fiber used in the fabrication of the fine cambrics and laces of Valenciennes and Belgium.

The second variety, which has received the term, "*lin chaud*, or *lin tetard*," produces a stalk of very moderate hight, branching and bearing numerous seed capsules. On this account it is especially the variety cultivated for seed; its fiber is coarse and short.

The third variety, "*le lin moyen*," as its name would indicate, holds a place intermediate between the two preceding varieties; it is the kind of flax most generally cultivated and known in Europe.

M. Mareau, of La Vendee, France, who has given this subject his especial attention, states "that a careful inquiry into the origin of these several varieties of the *Linum Usitatissimum*, based upon an experience in cultivation, has led to the conclusion that their recognition is due wholly to the mode of cultivation; and that from the seed of any one variety, we can in a single season obtain all the varieties."

"In a like manner," says M. Mareau, "we have in France an early flax, a winter flax, and a flax that ripens in the month of May."

In addition to the above named varieties, there is another variety of the *Linum Usitatissimum*, which is cultivated extensively in some parts of Europe and yields an excellent fiber. It is known as the "white flowered flax."

In Great Britain but two varieties of flax are recognized; the *spring* flax, with short knotty stems, whose seed capsules at the period of maturity, spring open with a perceptible sound, and the *close* flax, with longer, smoother stems, whose capsules give out their seed only when thrashed. The Germans designate the former as *Klang lien*, *Spring lien*, and the latter as *Dresch lien*.

(For the Scientific American.)

### Photographs on Printing Stone.

On reading in a late number of the "Scientific American," of a discovery recently made in France, by which a lithographic stone may be prepared, by the action of light, to print, it occurred to me that a description of a process invented by myself, in 1840, may be of some interest to your readers, and perhaps be the means of leading to greater results. My process was simply to polish a stone in the usual way with a fine surface, as for a transfer, and when dry, wash it over in a dark room, with a mixture of bichromate of potash and gum arabic; wipe the superfluous liquor from the stone with a fine soft sponge, and the stone is then prepared for the picture. If put into the camera in this state, as a silver plate is for a daguerrian picture, and left exposed to the light for twenty or thirty minutes, then removed and submerged, face up, in a trough of water, for a few seconds, then rolled up, it will produce a negative picture of the character of a mezotint. This may be afterwards changed to a positive or natural one, by various methods known in the art, such as slight biting with acetic acid, washing well in pure water, filling in with "composition work," then carefully rubbing down the surface to remove the first (light drawn) picture, and the stone is then ready to receive the common preparations of acid and gum, and is soon ready to work. The above will give a general idea of the manner of proceeding; a skillful workman will soon see what will be the best mode of working. In some few trials made at the above period I had very hopeful results, but various other things of more immediate importance occupied my attention and requiring all my time, I laid this subject by until a more convenient season, which has not yet arrived. Seeing no better prospect for resuming it, I have hopes that some one will take it up and perfect it. Before giving the rationale of the process, I will add one variety of my experiments.

I took a small picture of convenient size, varnished or oiled it, in order to render it as translucent as possible; this was laid with the printed side on the prepared stone, and a piece of plate glass on the top, to press the picture into as close contact as possible; the whole was then laid in the sun, and after an exposure of some fifteen minutes, treated as before in the water, &c.

You will readily perceive the causes active in the production of photography. Chromic acid in combination with an organic substance as gum, is rapidly decomposed by the action of light, into green oxyd of chromium, with the destruction of the gum, while the base (potash) is left in the stone. By this operation the gum which resists the ink from the roller is removed and a strong mordant for the ink left in its place. JOSEPH DIXON.

Jersey City, April 3, 1854.

### New Plan for Railway Bridges.

One of the Wheeling newspapers gives an account of a new plan for spanning navigable streams for railway purposes. The plan is not very clearly described, but we give it to our readers as we find it:

"We have been shown a plan and drawing, the invention of a gentleman in this vicinity of acknowledged reputation as a Civil Engineer.—This plan consists of throwing across rivers and other navigable streams of any magnitude, first a wire suspension bridge of sufficient hight to avoid any obstruction to navigation, to which a railway is permanently attached, extending on a level with, and connecting itself to the ordinary rail track on land. Into the receptical, which is designed to be of adequate size and strength to answer all purposes, engines, etc., are run from the land, and then in almost less time than we have taken to pen these lines, are drawn over the widest streams.

The motive power consists of an endless rope, passing over rollers of suitable form to sustain it in the proper position, and propelled by steam or other stationary power.

This invention is destined to be one of the most important for the railroad interests of this country that has ever been made. It supplies a great desideratum, and cannot fail to be brought into general use.—[Exchange.

[How is it possible that this bridge can answer such a purpose, if, as is stated, "a railway is *permanently* attached, extending on a level and connecting with the land track." Such an arrangement will surely obstruct navigation. The description must be wrong.

### Recent Foreign Inventions.

COPYING BANK BILLS.—Thomas Moss, of London, patentee.—This invention has for its object the providing of greater security against bank bills being copied by anastatic or other printing processes, and consists in printing the bill in the ordinary manner, and also printing the same surface with a device more or less extensive with transparent ink, after or before the other impression is made.

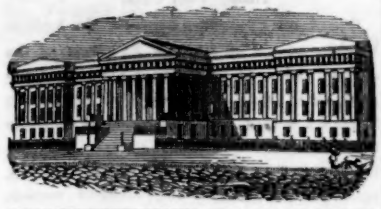
PAPER FROM PEAT.—J. Lallemand, of Besançon, France, patentee.—The inventor first washes the peat thoroughly to separate all the earthy from the fibrous portions, and then places these latter in a strong caustic lye, where they are suffered to soak for 24 hours. They are then removed and placed for about four hours in a bath of weak hydrochloric acid and kept constantly agitated. After this they are washed in clear water and then placed in a weak alum solution. After this they are bleached with chlorine, and mixed with from five to ten per cent. of rag pulp, and then go through the other common processes for making paper.

MANURE FROM SEA WEED—Mr. Longmaid, of London, patentee. Our readers will recollect that it has been already mentioned in our columns, that an English gentleman had asserted that he had discovered a cheap substitute for guano, and had claimed a prize offered by the Royal Agricultural Society for such a discovery. The notice of this discovery was obtained from an extract taken from foreign papers, which had been extensively copied by our home cotemporaries. It now merely remains for us to state, that this manure is made by treating sea weed with a strong caustic lye made by means of potash and lime, or soda and lime, and it is afterwards mixed with peat charcoal, or any of the aluminous earths. It appears to us that it will not prove a perfect substitute for guano, but we have no doubt of its making an excellent manure, especially if the sea weed contains, as it usually does, a great quantity of small shells.

JACQUARD APPARATUS—Benjamin Burrows, of Leicester, Eng., pat. This invention has for its object the arrangement of Jacquard apparatus in a manner suitable for opening two sheds simultaneously or separately, for the passage of two shuttles, one on each side of a central warp. For this purpose the usual lifting wires are employed, and those which are selected by the cards are moved up by the griff or frame to make the upper shed in a similar manner to that ordinarily practiced; but the perforated board, on which the lower ends of the lifting wires rest, is caused to descend, together with the unselected wires, by which means a lower shed is opened simultaneously with the upper one, thus admitting of two shuttles being thrown across, the one under and the other over a middle warp; by cross mounting and giving separate movements to these parts, varied effects may be produced, and two sheds opened, according to the effect desired to be obtained.

### Wood and Iron Ships.

A correspondent of the "London Artisan," (J. P. Drake, Naval Architect) has written a long communication, condemning the use of iron ships, and speaks enthusiastically of the superiority of wooden vessels. He alludes to American clippers, and calls them "splendid examples of naval architecture for mercantile purposes." He however criticises the unfortunate San Francisco steamer, and says she was badly constructed, having a preponderance in the after, instead of the fore body. This, he said, destroyed her steering qualities.



[Reported Officially for the Scientific American.]

## LIST OF PATENT CLAIMS

### Issued from the United States Patent Office

FOR THE WEEK ENDING MARCH 9, 1854.8

DROP AND DIE FORGING AND PUNCHING MACHINE—Solomon Andrews, of Perth Amboy, N. J. Patented in England, Oct. 7, 1852: I claim, first, lifting the drop or stamp near its central line of gravity by means of a pinion running on a shaft or pulley operated by a clutch combined with the driving power, whereby the stamp may be released and dropped at any point of its ascent at the option of the attendant and without stopping the other moving parts, as described.

Second, I cla im hollowing out the stamp and also the punch for the formation of a reservoir to hold water or other proper fluid for keeping the punch cool, not limiting myself to a punch merely, but also as applied to any other tool fitted to or used in combination with a stamp for operating upon hot metals.

Third, I claim interposing between the stamp and the die a secondary stamp or follower so constructed as to effect the cutting off of the blank from the bar, and when combined with the bolster shall form the box or die in which the nut is forged, and which secondary stamp shall also act as a releaser to remove the finished nut from the punch, as described.

Fourth, I claim the combination of the cam lever and the arc with the stem of the lower or discharging die, to be operated by the stamp during its ascent in order to raise and support the lower die until the nut is thrown off as described.

Fifth, I claim the wedge lever in connection with its spring, and its lever or arm, operating as described, for effecting the complete disengagement of the clutch teeth, so as to prevent those from clashing when the stamp falls, the whole being constructed and operating as set forth.

RAILROAD CARS—Berhard J. La Mothe, of New York City: I claim the construction of a frame of railroad cars with continuous elastic steel bands, or equivalent material, in the manner as set forth, namely: the transverse bands in parts each of one single piece to extend from one side of the frame to the other at equal or respective distances, bent to the proper shape of the car and the longitudinal bands to pass single between the above, forming with them rectangular squares and the three bands repeatedly in such a position to be firmly secured together by means of rivets or screws in such intersection of the rectangles formed by them, thereby obtaining with said material and from such an arrangement combined with lightness far greater strength and elasticity than the cars now in ordinary use possess, and consequently affording far more protection to life in case of accidents in railroad traveling.

I do not claim the frame of single transverse and single longitudinal bands, but limit my claim to the use of single, double, triple, or multiplied longitudinal bands combined with single, double, triple, or multiplied transverse bands, so that there shall not be less than three bands, while the number may be increased ad libitum in each intersection of the angles formed by them, the whole being constructed and used as described.

[A model of this improved car was on exhibition at the Crystal Palace]

TREATING CANE FIBER FOR PAPER AND OTHER PURPOSES—B. A. Lavender, and Henry Lowe, of Baltimore, Md.: we claim breaking down woody fiber of cane and other like plants and dissolving the gummy and foreign matters therefrom by means of muriatic or sulphuric acid of strength of 10 deg. Baume; or thereabout, preparatory to making hemp for bagging, rope, paper, pulp, &c., as set forth.

CARRIAGE TOPS—Rodney Miller, of Middlefield, Ohio: I claim the combination and arrangement of the rods or straps, either separately or combined, with the cranks, and the arms, in the manner specified, and operated by the lever for the purpose of raising and lowering carriage tops in the manner set forth.

CHAIN CABLE STOPPERS—Oldin Nichols, of Lowell, Mass. I claim preventing the backward slipping of the cable, as it is drawn inward, by my improved method of providing a catch for every link by means of the roller supplied with the projection recesses and ratchet teeth, in connection with the pawls, all arranged and operating together upon the cable, as set forth,

CHAIN CABLE STOPPERS—Oldin Nichols, of Lowell, Mass.: I claim the small guiding ridge in the bottom of, and combined with the encircling groove, or its equivalents, in the sustaining roller, so as to cause the links of the chain to assume positions sufficiently inclined to be guided alternately on opposite sides of said ridge, for preventing a twisting of the cable, but at the same time, to bring each link against which the pawl acts, so near vertical position as to be securely held by said pawl, as described.

GATES FOR WATER WHEELS—Elijah Roberts, of Rochester, N. H.: I claim the arrangement of the rods which are made to slide through the shutes or gates, so that all the gates or shutes may be opened simultaneously or allowed to close by the pressure of the water when not obstructed by foreign obstacles, as set forth.

PREPARATION OF VEGETABLE FIBERS—David A. Wells, of Cambridge, Mass.: I do not claim broadly subjecting vegetable substances to the action of acids, as this has been done before for other purposes and under essentially different proportions and circumstances, and with a different view, and therefore I do not wish to be understood as claiming broadly subjecting vegetable substances to the action of acids, except when used for the purpose of removing bases which would entirely, or for too long a time, resist the chemical action of the other branches of the process employed to obtain cellulose.

I am also aware that lignine has been separated from woody fiber by dissolving the cementing substances in alkalies more or less caustic and then subjecting them to subsequent mechanical operations for obtaining fibers I, do not therefore claim simply subjecting vegetable substances to the action of caustic alkalies.

I am also aware that vegetable substances, after being subjected to the action of caustic alkalies have been treated with acids but under different circumstances and for a different object. Heretofore this has been done for the purpose of removing any adhering alkali, and all other foreign matters, what in my process I use an acid of an entirely different strength, not for the purpose of removing any alkali remaining from the previous branch of the process, for this I previously wash out and not for the purpose of removing any gummy or glutinous matter, for this I previously remove by means of the caustic alkali.

But I have found that the cellulose treated with an acid of such a strength and for such a length of time is so altered that the subsequent bleaching by the ordinary means is greatly facilitated and cheapened, and therefore I do not claim broadly treating vegetable substances with acids after they have been subjected to the action of caustic alkalies irrespective of the circumstances and the purposes specified.

First, aware that acids have been used in the treatment of crude or unprepared vegetable fibers chiefly for the purpose of breaking up and mechanically separating the woody and gummy matters, I do not therefore claim any such process.

But what I regard as my invention is removing coloring and resinous matters, from the cleaned and dressed flax, hemp, and other equivalent textile and fibrous material, designed to be spun, felted, &c., by means of weak acid of about 3 deg. Beaume, as set forth

In combination with the above I also claim the employment of caustic alkalies, as specified, to obtain cellulose from vegetable substances for the manufacture of paper and for other purposes in combination with the use of alkaline earths, as specified, to preserve or restore the caustic state of the alkalies, as set forth.

And finally, I claim in combination with the process for the separation of cellulose from vegetable substances subjecting the products thereof to the action of a solution of efflorescent salts, as specified,

[Every improvement in the preparation of flax is of great importance to our country. We know that many plans and processes for effecting the easy and complete separation of the woody from the fibrous parts of flax, have been employed, and yet difficulties surround every one of them. Dr. Wells the discoverer of these new improvements is a good chemist, and has deeply investigated this subject. The results set forth in his patent were only obtained after laborious researches and many experiments. We are confident that he has added something new and important to the chemistry of flax treatment, and we hope his invention will be the means of removing every difficulty which now lies in the path of preparing flax for spinning and weaving]

COPS FOR SEWING MACHINES—William H. Atkins, (assignor to Samuel J. Parker,) of Ithica, N. Y.: I claim the use of a cop or bobbin, without spindle or spool in combination with a shuttle, or its equivalent, when the thread is drawn or fed out from the inside of the cop or bobbin, by which means I secure a uniform tightness or tension on the cop or bobbin thread, as it is drawn or fed out from the shuttle, as described.

WATER WHEELS—Lorenzo D. Goodwin, of Pennville, N. Y.: I claim, first, the form and proportions of the buckets, as set forth, commencing in a true circle at a tangent to the outer periphery and terminating in a straight line of fifteen degrees in length, at the inner curve and at a tangent thereto, as explained.

I also claim the self-regulating gate to the scroll constructed and arranged in the manner set forth.

CANDLE MOLD APPARATUS—Willis Humiston, of Troy, N. Y.: I claim, first, the wick stretcher so arranged that the wicks may be uniformly stretched before the material is run into the molds, and the friction or strain be removed therefrom before the candles are drawn from the molds, to prevent the breaking of the wicks, as described.

I also claim, in combination with the wick stretcher, the centering bar or plate with its stop or guide, for first properly centering the wick at the top of the mold before it is stretched and held, as described.

BEDSTEAD FASTENINGS—E. B. Ball, of Kalamazoo, Mich: I claim fastening the rails to the posts of a bedstead by means of the combined sustaining brackets and conical fastening pins secured to the posts and the conical holes in the under sides of the rails, arranged and operating with each other as set forth.

MACHINES FOR CORRUGATING SHEET METAL—Solomon G. Booth, of New York City: I claim the construction and arrangement of the dies so as to adjust them to any depth of corrugation and thickness of metal by having the pieces separate from the parts, so that they as well as the cam shaft can be raised and lowered to make a deeper or shallower corrugation, as set forth.

[This very excellent improvement is noticed on page 122, of this volume.]

VALVE COCKS—Benjamin Eakins, of Spring Garden, Pa.: I claim the peculiar construction of the valve with the manner of opening and closing the same, as described.

AMALGAMATING GOLD AND SILVER—A. K. Eaton, of New York City: I claim the employment of an alloy of mercury and zinc, instead of pure mercury, in the process of amalgamating precious metals, as set forrh.

RAILROAD FROG GUARDS—Henry W. Farley, of East Boston, Mass.: I claim the supporting of the track rail opposite the frog on the projecting base of the frog guard, as set forth, so that without the intervention of bolts or other fastenings liable to become loose or deranged, the guard is held down by the track rails.

But I make no claim to supporting the frog guard and adjacent track-rail in a common chair, as this is neither new nor capable of affording the security against accidents which my invention affords.

CRANBERRY WINNOWERS—Phanuel Flanders, of Lowell, Mass.: I claim the cleaner and the arms or their equivalents in substance, and the separator when the same is made and operated as set forth.

MACHINE FOR MAKING FRICTION MATCHES—Wm. Gates, Jr., of Frankfort, N. Y., and H. J. Harwood, of Utica, N. Y.: We claim, first, the employment or use of the endless chain formed of a series of clamps, constructed and arranged as shown, for the purpose of securing the match sticks from the cutting tool and conveying them to the sulphur and igniting compounds with which their lower ends are covered, as described.

Second, we claim the peculiar form of the cutting tool, as described, viz., said tool being formed of a series of circular cutters, connected by semi-circular cutters, by which form the match sticks are placed in the clamps of the chain at a sufficient distance apart to prevent their lower ends from being cemented together when immersed in the sulphur and covered with the igniting compound; said tool also, by being constructed as described, cutting the match sticks smoothly and easily from the block.

Third, we claim opening or parting the clamps of the chain at the proper time, or when each clamp is directly over the cutting tool, by means of the wedge operated by the cam or its equivalent, for the purpose of allowing the match sticks to enter the clamps as the cutting tool ascends to the top of the block, as described.

[This is a good improvement and deserves the attention of those interested in the manufacture of matches.]

TREATING VULCANIZABLE GUMS—Chas. Goodyear, of New Haven, Conn.: I claim the method of manufacturing compounds of caoutchouc, gutta percha, and other gums susceptible of vulcanization in sheets, by covering the surface or surfaces of the sheets of gum with sheets of paper or cloth, or equivalent, and then confining the same during the process of vulcanization by pressure between plates of metal, as described.

MACHINE FOR CUTTING VENEERS—Carmi Hart, of Bridgeport, Conn.: I claim, first, cutting veneers or other thin stuff by giving to the shaving knife a rectilinear movement towards and through the log at the same time that a rectilinear movement is given to the log either transversely or diagonally to the movement of the knife so as to produce a long continuous drawing cut, as described, whether the said movements of the knife and log are produced by the precise arrangement of mechanical means described, or any other substantially the same.

Second, making the ways upon which the log carriage moves adjustable, as described, relatively to the ways in which the knife and cutting table move, for the purpose of giving more or less of a drawing action to the cut, as the nature of the stuff to be operated upon may require.

Third, attaching all the necessary appendages for holding the log and feeding it to the knife to a true table, capable of being adjusted circularly within the main frame or part of the log carriage, as described, for the purpose of presenting the grain of the stuff at any desired angle to the edge of the knife or direction of the cut.

Fourth, suspending the log or block above the knife by griping it with clamps which form part of a suspending head, which supports the weight of said log or block, and prevents it dragging over the edge of the knife during the backward movement of the same, and only allows it to be lowered under the control of suitable feeding mechanism.

Fifth, setting the lever handle, which holds the clamps upon the log, free from the notched bar, 12, by which it is secured for that purpose by means of the bar, 33, and the inclined block, 35, of which the former is attached to the suspending head, and the latter to some fixed point on the turn-table of the log carriage, and the former is made to slide by coming at a proper time in contact with the latter in such a way as to raise the lever handle, as described.

Sixth, making the slots in the clamps which receive the bar, M, and screw, N, of which length that, after the clamps are arrested by coming in contact with the proper part of the log carriage or turn-table, the motion of the follower and the other parts of the feed motion may continue till it is desirable to stop them, as described.

Seventh, the mechanism described for rendering the pawl of the feed motion inoperative and thereby stopping the descent of the suspending head and the feed of the log at the proper time, to wit, the bar 24, pin 26, spring 27, rod 28, arm 29, shaft 30, feather 31, and angle piece 32, the whole being combined and applied, as set forth.

[If we mistake not, this is the most valuable improvement ever made in veneer cutting machinery. Patents are in progress through our agency in Great Britain, France, Spain, &c.]

COMBINED TABLE AND CHAIR—Stephen Hedges, of New York City: I claim the manner described, of rendering a table of ordinary construction susceptible of being combined with a chair, and of being used as a smaller stand or writing desk and chair combined, by constructing the table in two sections, and jointing said sections together, one of which forms a chair with a flap or removable top; and the other the stand, smaller table, or writing desk, with a stationary top, having the flap of the chair hinged to it, one end of each section being jointed together by a hinge, upon which the chair turns when it is desired to use the table as a stand or writing desk and chair combined, or after it has been used as such, as described.

TREATING CAOUTCHOUC AND OTHER VULCANIZABLE GUMS—L. O. P. Meyer, of Newtown, Conn.: I do not claim interposing between sheets of gum, &c., to be cured sheets of flexible material, when the series of sheets thus piled are confined between plates of iron during the process of vulcanization, as this makes no part of my invention, which consists in covering the surface of what is known as the hard compound of caoutchouc with tin foil or other equivalent substance, to preserve the form previously given, by embossing or molding the contact of the tin foil during the curing process, having the effect, as I have discovered, to preserve the form and the surface without pressure or molds.

I claim the use of tin foil, or its equivalent, for the purpose of preserving, during the process of heating, the forms or shapes given to the hard compounds of vulcanized caoutchouc and other vulcanizable gums, as described.

ENEMA SYRINGES—Morris Mattson, of Boston, Mass.: I claim, first, the combination of the thumb or finger rest, with the barrel and piston, as specified.

Second, I claim the upper ring valve seat, and the perforated tube, in combination with the disk or valve, and its seat and chamber, operated as described.

MACHINES FOR MAKING WIRE NETTING—John Nesmith, of Lowell, Mass.: It being understood that the take-up motion acts or operates at the right time, so as to keep the wire straight and smooth during the operation.

I claim, first, revolving the wires by the means, as described, for the purpose of keeping them parallel to each other, so that they cannot get entangled with each other during the process of making the netting or fencing.

Second, I claim vibrating the wires alternathly from the left to the right, or the right to the left, before or after or at the same time of twisting them, the said wires together, by means of the cams and the shippers, connected to the said cams by lever for making wire netting and fencing.

Third, I claims the jaws or clamps, or the same in substance, for she purpose of drawing the wire through the machine at the required times, by means of the cams and levers operating the same, as set forth.

Fourth, I claim the two planes, and their mechanical equivalents, with the cams and levers for operating the same as set forth.

Fifth, I claim the wire reels and movable reel stands, with the friction springs for the reels and holes through either end of the said reel stands for admitting, protecting and guiding the wire or the mechanical equivalents of the said reels and reel stands.

Sixth, I claim the feeding and twisting gears, with or without their centers perforated, to admit the border or warp wires passing through the same, and the said gears having slots cut in them for the receiving and sliding of the ends of the stands and wire in the same, as set forth.

DRILL FOR METAL DRILLING—Abiel Pease, of Enfield, Conn.: I am aware that drills have been used with a hole in the center extending lengthways of the drill, but such I do not claim.

I claim constructing a drill for drilling metals with a notch, with two cutting edges, which leave a guiding cone in the center of the hole as it is bored, which is cut down as the drill advances, in combination with the beveled edges of the lips, as specified.

TRAINING THE VINE—Joseph Sollenberger, of Higginsport, Ohio: I do not claim a post in itself, nor a wire hook in itself; but I claim a training post composed of a staff and hooks at proper intervals on the staff, for the purpose of rapily treating and dressing vines, as described, at the proper season, the staff and hooks being prepared and located all ready for instant action when the season for vine dressing arrives, as set forth.

PUMPS—Jacob Edson, of Boston, Mass.: I claim the cap with its valve, constructed and arranged as described, the cap being cut away upon one side for the accommodation of the valve, and packed at the points to prevent the return of the water from the passage to the cylinder, the valve being made to bear immediately upon the upper end of the cylinder, by which construction and arrangement of parts I am enabled to force out from the cylinder, each time the valve is raised, any air which may have collected above the piston, and thus effectually avoid the air cushion above the piston.

HEATING SKELPS FOR THE MANUFACTURE OF WROUGHT-IRON TUBES—James McCarty, of Reading, Pa.: I claim the new method of operating, as described, viz., heating the skelps in a furnace, constructed as set forth, with raw coal as fuel, whose combustion is maintained by a blast of air forced into the furnace under pressure, as set forth.

BIT FASTENING FOR CAST IRON BENCH PLANES—Wm. S. Loughborough, of Victor, N. Y. I claim, first, the combination of the adjustable lever cap, with the screw by which it is operated.

Second, the manner of connecting the said adjustable lever cap, with the stock of the plane, as set forth.

CROZING THE ENDS OF STAVES—Geo. W. Livermore, of Cambridgeport, Mass. Patented in England August 31, 1853: I claim the combination of the carrying drums, the pressure bars, and the revolving cutters, with the hopper, for the purpose of delivering the staves one by one to the cutters; the hopper being constructed as represented, permits the escape of the stave on one side and not on the other.

MACHINE FOR DRYING TOBACCO—T. W Lafetra, of New York City: I claim drying tobacco by forcing currents of air through it, in combination with the confining thereof, by means of the chambers or cells, formed as described, or by any similar mode.

MAKING RAILROAD CHAIRS—John Ogden, of Philadelphia, Pa. (assignor to Chas. S. Ogden): I do not claim the chairs described, nor any other particular form of chairs for railroad rails, nor do I claim operating the punches and dies by means of cam rollers.

I claim making chairs for railroad rails by passing the hot mill bars direct from the rolls out of which the chairs are to be made, without re-heating, and by the same working hands usual at roll train, between a pair of rolls constructed and operating as described, and the punches and dies for punching and forming the chairs, being secured around the peripheries of said rolls, as described.

### Gilding Silk, Cotton, and Woolen Thread.

We here present the substance of the specification of the American patent granted on the 14th of last month, to Albert Hock, native of Switzerland, but now residing in Paris, France. The words in which we present the specification are not so numerous as those in the patent; but they render the matter, we believe, more intelligible, while nothing essential is omitted. Some things not mentioned in the patent are here given, in order to impart a complete understanding of the whole process.

DESCRIPTION.—Take a roller of wood of about 3½ inches in diameter, or of such thickness that the metal leaf intended to be used will pass around it, to avoid waste of leaf. The length of this roller must depend on the quantity of silk or other thread to be wound thereon. The silk or thread before it is placed on this roller for gilding, must be run upon one long reel, and run through a box containing some gilder's size, made of parchment cuttings, or a weak solution of gum, on to another reel, passing through a slit in a piece of cloth after leaving the box, to wipe off the superfluous size. The thread must be run upon the second reel in such a manner that one thread shall not lie on the top of another, but be laid along spirally from end to end. It is there suffered to dry, and is then fit to be run on the roller, on which the metal leaf is laid. It is run upon this roller also spirally, with a space between each thread of its thickness to allow the leaf to be pressed down and between each. When the thread is run on the metal-leaf roller, the whole is subjected for a few seconds to the vapor of soap suds; then metal leaf is laid upon the thread, and pressed firmly down with a pad of dry cotton, when the metal leaf is found to adhere to the thread, which may then be run off on a spool, passing to the same between glass or bright metal surfaces to burnish it.

In some cases the metal leaf is only applied to parts of the silk or other thread, leaving the other parts uncoated; or different metals, gold and silver leaf, may be applied in sections, or different colored leaf of the same metal may be applied, by which means varied and beautiful fabrics may be produced, especially in using such thread for weft, and weaving it into cloth fabrics.

Care must be exercised to have the thread perfectly coated with size or gum, before it is run on the roller of metal leaf, and it will answer perfectly if the gummed thread itself is only slightly damped to make the leaf adhere.

This process of gilding thread was patented in France, Dec. 15, 1852. It is certainly a very simple method of gilding, to produce gilded textile fabrics.

### What is Flying?—Answer to J. B. C.

MESSRS. EDITORS.—"It" *can* "be demonstrated by the known laws of mechanics that birds can fly." If you take the bottom of an old tin coffee pot between your thumb and fingers, with its plane parallel to the plane of the earth, and throw it forcibly forward, it will occasionally, by a repetition of the same experiment, ascend above the level of its line of projection. A slight elevation of its front part when projected, will make it mount the air, from two forces—projection and impact. The same mechanical effects are displayed, as the bird frequently undulates forward when about to end his flight in view of a perch, especially when he makes a feint or two before he really does alight.

Eagles, vultures, &c., frequently mount up in spiral circles. This has often puzzled observers, inasmuch as the bird seemed to mount without much exertion, to a great extent, simply by expanded wings without flapping. If watched closely, it will be observed, however, that they do flap their wings frequently, but a great part of the force in raising them up is supplied by the strong breeze almost continually existing at great altitudes. While breasting the breeze, their front slightly elevated, with a momentum derived from their swoop with the wind in the opposite part of the circle, they mount up inclined planes of air, as it were. In this mode of ascent they use no more muscular power of the wing than sufficient to balance gravitation. The lifting up is performed by the strong breeze in the same manner that a body suspended by a string in the open air would be lifted up by a strong wind blowing against, when it hangs inclined to the breeze, as the position of the bird is when it breasts the wind.

I thought for a long time as J. B. C. does, but close observation of the vulture's flight, and the study of dynamics, mechanical forces, and reasoning by the method as inculcated by the "Scientific American," in its dissertations upon caloric and static pressure engines, &c., have enabled me to satisfy my own mind that the flight of all birds is demonstrable by the known laws of motion. J. W.

Lancaster, Pa., April 1st.

# New Inventions.

### Rotary Drying and Tentering Machine.

D. W. Kennedy, of Augusta, Va., has applied for a patent on a new and useful rotary machine, for drying and tentering cloth. The nature of this invention consists in stretching the cloth on two spiral series of tenter hooks attached to the faces of two wheels or open discs, which are placed upon the same shaft, and receive a rotary motion. The piece of cloth being stretched between these two series of hooks is made to assume a convolute form, but a sufficient space is left between the volutions for the free circulation of air, which is drawn in through the open discs at the sides when revolved, while the moisture is thrown off at the circumference. The revolution of the cloth on this spiral wheel, and the rapid circulation of air between the volutions of cloth soon expels all the moisture. A central drum on the shaft to contain hot air or steam, also aids in drying the cloth rapidly, as the currents of air which are driving through the cloth, are thus heated. The rims on which the tenter hooks are secured are capable of being moved on the shaft nearer to or further from one another, for the purpose of hooking on the cloth and then stretching it, and also to suit different widths of cloth. This machine appears to be a good invention.

### Substitute for Brick and Stone.

W. H. Allen of Brooklyn, N. Y., and G. Bridgeman, of Pittsfield, Mass., have invented a new substitute for stone and brick for building purposes. They manufacture blocks composed of a peculiar cement mixed with sand, fine gravel, or broken stones. These materials are compounded and molded in dies (which may be made to form an ornamental surface on the blocks) and then they are set aside to dry, after which they can be used for building walls, columns, &c., and are said to be a cheap and excellent substitute for the materials stated. Measures have been taken to secure a patent.

### Improved Car Truck.

Cornelius Brooks, of the city of Albany, N. Y., has taken measures to secure a patent for improvement in car trucks, which consists, 1st. In attaching each wheel of a truck to a separate axle, and securing the two axles of a pair of wheels together, by means of an encircling clamp. One of the axles is hollow and receives the other axle. Each wheel of a pair is free to move of itself. Around the axle of each wheel there is a collar box, having friction rollers, and the axles are attached to these collar boxes by diagonal rods. 2nd. There are guide wheels on each truck, which, when they meet an obstruction, rise over it, (being secured to springs) and then descend on the rail again before the center bearing wheels meet the obstruction. The object of the improvements are to allow the cars to move more freely in turning curves, and passing over obstructions or inequalities of the track.

### Gates of Saw Mills.

U. B. Vidal, of Columbia, Pa., has applied for a patent for an improvement on raising and lowering the saw gates of saw mills, by a cam arranged on the driving shaft to give the gate a regular up and down movement as the said shaft revolves. This cam works in two serpentine ways in the saw gate.

### Improvement in Locks for Safes, &c.

Jacob Klein, of Williamsburgh, N. Y., has invented an improvement in locks for bank vaults, safes, &c., for rendering the tumbler locks more secure against being opened. A series of slotted tumblers are arranged and operated in a peculiar manner, and in combination therewith, a series of disks are arranged for controlling the action of the key. Measures have been taken to secure a patent.

The "Oswego Times" notices that large quantities of bonded merchandise are arriving at that port by Railroad from Portland, Maine. The goods come from England by the line steamers between Liverpool and Portland.

### Improved Excavator.

A. D. Brown, of Opelika, Walker county, Ga., has had upon exhibition in this city the model of a machine, which he calls a Railroad Excavator, and which is a very ingenious and beautiful piece of workmanship. We saw it in operation, and though we have little knowledge of Railroad excavation or of Mechanics, and cannot say whether it will answer the purpose for which it is designed, yet we can testify to the fact, that it shovels dirt and loads a car with it with very great rapidity. The superiority of this machine over others which have been employed for the same purpose, is, that it is cheaper and simpler, more durable, because nothing but very light and quick work is expected of it, and less expensive in the labor employed about it. It can be run with a small engine of two or three horse power.

Practical mechanics and engineers who have examined it have expressed very favorable opinions of it, as destined to effect a great economy of time and labor in the grading of railroad tracks. Mr. B. is a remarkably ingenious mechanic, and we would be glad to see him realize some practical benefit from some one of the many inventions he has effected.—[Savannah Journal.

## IMPROVED VALVE COCK.

The annexed figures represent an improved valve cock, for which a patent was granted to John Griffiths, of Philadelphia, on the 14th of last February. Figure 1 is a side view of a stop cock constructed on the principle of this invention, and figure 2 is a longitudinal section of the same through the center. Similar letters of reference indicate like parts.

The valve cock possesses advantages over the plug cock in its lightness, and the facility with which the valve is ground tight, but the valve cock as constructed is very imperfect. It is usual to make the screw by which the valve is opened and closed, on the valve stem, and unless every part is truly constructed, one side of the valve will be made to close or bear upon its seat, harder than the other parts, and the stem is thereby liable to be bent. This evil is increased by vulcanizing the bearing of the valve, hence it is customary to make it with a narrow seat. The object of this invention is to construct the cock in such a way that the valve will always close truly, and thus allow it to be made with a bearing of such width as will enable it to be kept as tight as the best plug cock. The valve is therefore made with a cylindrical stem passing through a hollow stem, which is attached rigidly to, or forms part of the body of the cock, and is furnished outside with a screw, to which is fitted a nut carrying a yoke, in which the valve stem is capable of turning freely, but not of moving longitudinally. By turning the nut the valve is raised and lowered—from and to its seat—in a right line, the valve being kept in such position that it will fall into and close tightly in its seat.

Figure 1.

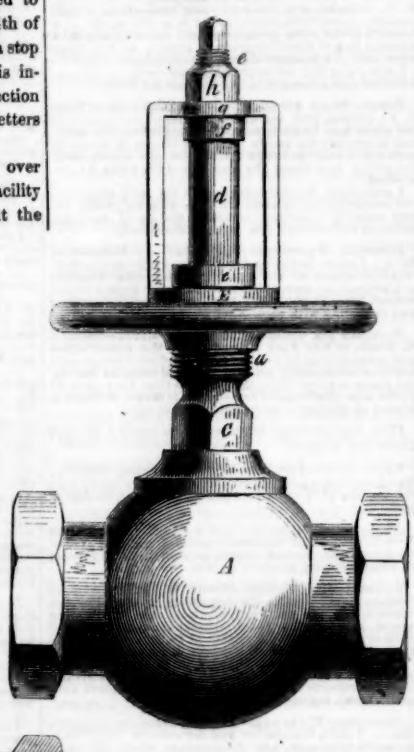
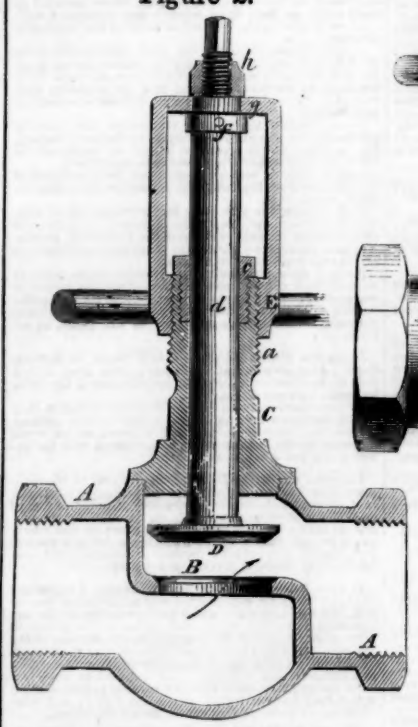



Figure 2.




A is the body of the cock, and B is the valve seat, which do not differ materially from other valve cocks; C is the hollow fixed stem, which, in the cock shown, is secured into the body; it is furnished at its upper part with an external screw, *a*; it is provided with a stuffing box, *b*, and gland, *c*, for the purpose of packing the valve stem; D is the valve, and *d* its stem, which is furnished at its top with a screw, *e*, and a little below the screw with a collar, *f*; E is the nut by which the valve is opened and closed; it is fitted to the screw, *a*, on the hol low fixed stem, and is provided with a wheel or lever, by which it is turned; it is furnished above with a yoke, *g*, which fits easily to the valve stem above the collar, *f*, being confined to the stem by a nut, *h*, fitting to the screw, *e*; this nut fits down to a shoulder, so that it does not bite the yoke, but simply prevents the longitudinal motion of the valve stem and nut, independently of each other, not preventing the turning of the nut. The valve is raised and lowered by the turning of the nut. The valve stem is squared at the top to receive a wrench for grinding the valve. To grind the valve, the nut, *h*, should be taken off. The valve of a cock of large size, constructed in this way, may be ground in a few minutes; whereas a three-inch plug will commonly take five or six, and sometimes ten hours to grind in tight, whenever it leaks.

In cocks of large size, the body, A, may be made of cast iron, and the seat, B, and stem, C, of brass, which construction will reduce the expense. The invention is applicable to cocks of almost every description.

Mr. Griffiths informs us that he has disposed of upwards of five hundred of the cocks, and that they give perfect satisfaction to the purchaser. Leaky cocks are a sore trial to the patience of engineers; this valve is worthy their attention as a remedy for such an evil.

These valve cocks are manufactured by Mr. Griffith, at his brass foundry, No. 15 North 7th street, Philadelphia. For more information about that which relates to business connected with it, we refer to an advertisement of the patentee on another column.

### Tilting Coal Cars.

One of our exchanges says:—"Mr. Andrew Patrick, an old miner, now in charge of the Jackson Mines of the Parker Vein Coal Company, has invented an improvement which is worthy of note. It is intended to facilitate the delivery of coal from the cars to the railroad wharves of Cumberland, in the following manner:—Mr. Patrick's improvement consists of a new arrangement of the fastening of the door of the mine car, by which the door opens itself when the car enters upon the tilt frame at the head of the shoot, which conveys the coal to the large cars. The tilting frame has attached to it fixtures invented by Mr. P. which make it a self-acting tilt. The car enters upon it, "dumps" itself and returns to a level position immediately, in readiness to be returned to the mine. Cars constructed with this improvement, and a tilting apparatus of this form, have been in use several months at the mines, in charge of Mr. Patrick, and the saving of labor and economy of time is so manifest, that they cannot fail to be adopted.

### A New Motor.

The "Worcester Spy" gives the following account of a new invention which is to supersede the steam engine:

"The machine is called a 'vapor engine,' and the propelling power is produced by the expansion of air in cylinders by the application of steam.

The invention comprises two features, one entirely mechanical, the other chemical. The first consists of the peculiar arrangement of the valves, by which the atmospheric resistance of the 'exhaust' is not felt, consequently a saving of 15 lbs. to the square inch is effected, which in common practice is equivalent to a saving of 33 per cent. The peculiar mechanical structure of the valves and their connections are also prominent features in the invention on the score of wear and tear.

The chemical feature is that of rendering atmospheric air more sensitive to the action of caloric than is laid down in the books, viz.:—doubling its volume under a temperature of 212°, whereas a temperature of 480° has been considered requisite to dilate air to twice its normal volume. It is claimed by the inventor that the combination of these two inventions gives a result as six to one in favor of his invention over the ordinary steam engine, and an explosion cannot occur from carelessness in the use of the engine."

Before sending forth the above to the world the "Spy" should have made apologies for its former assertions respecting the electric light, &c. The above engine will go the same road as the "water gas light." The learning of the "Spy" happens to be sadly out of joint, for if by a *chemical* change the atmospheric air is made more sensitive to heat, then for a certainty it must be changed to something else—ceased to be atmospheric air.

### Wind Mill.

Gerard Sickles, of the city of Brooklyn, N. Y., has invented a new improvement on Wind Mills, by constructing them with a series of double sails, connected by gearing or levers, the said wings being made to open and shut vertically in pairs at certain points. Measures have been taken to secure a patent.

### Decay of the Teeth.

We have received a letter from E. Hale, Jr., of St. Louis, in answer to one which lately appeared in our columns on the decay of teeth, wherein it was stated that a child of the correspondent had decayed teeth, which could not have been caused by acid, as no acid had ever been taken into its stomach. Our present correspondent in correcting that idea, states that when the stomach is deranged it generates an acid which acts upon and destroys the teeth. He asserts that where there is no derangement of the stomach there can be no decay of the teeth.

We are free to admit that healthy persons in general, have sounder teeth, than those who are unhealthy; still there are thousands who have decayed teeth that never were troubled with acidulous stomachs.

Scientific American.

NEW YORK, APRIL 15, 1854.

### Sewing Machine Decision.

We last week referred to the recent decision of Judge Sprague, of Boston, in the case of Elias Howe, Jr., praying for an injunction to restrain O. Underwood and others from infringing his patent granted on the 10th Sept. 1846, for improvements on sewing machines. The defence relied solely on evidence to show that the plaintiff's machine was not novel. For this purpose they brought forward the remains of an old sewing machine, said to be made by Walter Hunt, of this city, in 1834. The machine made by Hunt in that year, his brother Adoniram carried to Baltimore, in 1835, and the testimony of E. Johnson, in whose house he boarded while there, was given, who asserted that he, with A. Hunt, made canvas tubes with said machine, the only practical use to which it was ever applied.

Two inquiries presented themselves to the Judge. 1st. Was this machine ever perfected. 2nd. Had it not been abandoned and forgotten before Howe's invention. With respect to the first inquiry, as a question of law, Judge Sprague says:—

"The patent law goes upon the ground that when a man by his knowledge and skill has made and *perfected* a machine, the public are then put in possession of the invention, and have the benefit in some form of that knowledge and skill, and the man who comes afterwards cannot deprive the public of that benefit, though he may be the inventor of a machine. A machine to anticipate any subsequent discovery, therefore, must be perfected, that is, made so as to be of practical utility, and not be merely experimental and end in experiment. If it is an experiment and is laid aside as unsuccessful, however far it may have been advanced, however many ideas may have been combined in it, which subsequently taken up might, when, perfected, make a good machine, still not being perfected, it has not come before the public as a useful thing, and is therefore entirely inoperative as affecting the rights of those coming afterwards. This is important to be understood, because the idea has been carried all along that if a prior inventor had gone to a certain extent, although he fell short of a complete machine—practically useful—those who come after him have no right to secure to themselves the advantage of their invention. *This is not the law.* If Mr. Hunt did not go to the extent of having perfected a machine, although he made many ingenious devices, it was in the eyes of the patent law *a nullity*; it gave nothing to the public."

We have presented this extract of the decision, because it has a most important bearing upon the question, "what constitutes priority of invention." The decision renders this very clear.

It is admitted that Mr. Hunt made a very ingenious machine in 1834, one similar to Howe's, but says the Judge, "was it perfected within the meaning of the law, or did it end in experiment?" To this inquiry the answer is made that during a number of months, while A. Hunt was in Baltimore, he and E. Johnson, both practical machinists worked upon it, experimenting, and that it never did operate perfectly. It would sometimes sew for six or eight stitches a perfect seam, then the threads would lie along, not being looped together, and the shuttle would stop in the race; nobody could tell when the machine was put in motion how it would operate. In that condition it was brought back to New York, and there was no evidence to satisfy the Court that any improvement was made upon it afterwards. "The recollection of that machine as a complete machine," says the Judge, "rests exclusively with Walter Hunt." In another place he says, "After having laid aside his machine from 1835 to 1851, he comes then to say what his machine was. What has waked him up to that effort and that recollection? The invention of Howe is made public by his having obtained a patent; a suit at law is brought by Howe, and then Mr. Hunt is called as a witness for the defence in that suit, and it is in proof that Walter Hunt had seen Howe's specification, and had seen Lerow & Blodgett's machine at work, which is admitted to be a copy and infringement of Howe's patent. He then had the advantage before he undertook to describe his machine of 1834." "The whole testimony leaves upon my mind no doubt that however far Mr. Hunt may have advanced with his machine, it was never perfected in the sense of the Patent Law; it was laid aside as an unsuccessful experiment, until the introduction of Howe's machine. The result is, that the plaintiff's patent is valid, and the defendant's machine is an infringement. An injunction is granted."

The Judge having come to the conclusion that the machine of Hunt was never perfected, does not consider the question of abandonment, for that is only necessarily involved in the first proposition being proved. If Mr. Hunt's machine had been a perfect one, and had been used in public for two years without anyeffort being made to obtain a patent, we consider that the Judge would have declared the invention abandoned to the public. This we think is the strict meaning of the present law.

This case is certainly a triumph for Howe's patent, but he must be generous and not oppressive in his claims on that account.—We perceive that Mr. Singer has advertised that he has sued E. Howe for the infringement of Greenough's patent of 1842. What the result will be we cannot tell. One thing is greatly to be regretted, namely, that whenever a patent becomes valuable, there seems to be no end, at least, for some time, to the troubles of the real benefactor—the one who has rendered it a public benefit. We have a firm reliance, however, on the right party, whoever that party may be, obtaining a complete triumph at last.

### Machinery in the United States.

The London "Morning Advertiser," contains an article on the Report of the British Commissioners to the New York Crystal Palace, which is not a little flattering to the inventive genius and enterprise of our people. The report on machinery was presented by Commissioner Whitworth, of Manchester, Eng., the famous manufacturer of tools, such as lathes, screw cutting machines, &c. The Report is a very able one. It speaks of the "extraordinary energy of the people of the United States and their peculiar aptitude in availing themselves to the utmost of the natural resources of their country."—Speaking of labor saving machinery, it says, "the comparative fewness of the people is compensated by the eagerness with which they call in the aid of machinery, in almost every department of industry, as a substitute for manual labor. In making their plows, eight men by machinery finish thirty in one day; a shoemaker's last is made in a minute and a half, and one woman by a machine does the work of twenty by hand." The report speaks not only admiringly but in terms expressive of astonishment, of all our machines for working in wood. To Yankee clock making, it pays a high compliment, and the Boston Telegraph Fire Alarm System receives, as it deserves, a high encomium. One statement, however, surprises us, in reference to American spinning frames, it says, "one man can attend to a mule containing 1,088, spindles, which is equal to the work of 3,000 men." In Manchester if our memory does not betray us, there are also *mules* of 1400 spindles, each attended by one man, with piecers. On the whole the report is good; and it does great credit to Mr. Whitworth. The British Commissioners were not idle while they were here. They gathered up, and have presented an amount of information respecting American art and industry, that is truly astonishing. They deserve our thanks, for the spirit which is manifested in their reports. They are kindly in tone and free from all rant and fustian.

### The Comet.

For several evenings past a comet of a larger size than that which appeared last August, has been seen at the close of twilight, west-northwest, nearly due west and about twenty to twenty-five degrees above the horizon. The nucleus is about the size of a star between the first and second magnitude and reflecting a tail at an oblique angle towards the zenith. The apparent length of the tail is from five to six feet, and the width from three to four inches. Upon a dark night it would have a brilliant appearance, but its light is much lessened by the brightness of the moon. It is, nevertheless, exceedingly attractive, even in the brightest of evenings.

### Steamboat Laws.

Many laws have been made for regulation of steamboats, and the better preservation of the lives of passengers on them, and yet there is not a single one of these laws which does not betray an amount of ignorance or something worse, on the part of our legislators, too gross to be passed over without animadversion. Thus, for example, the last steamboat law that was passed, made it obligatory on steamboats navigating rivers, like the Hudson, &c., even when not carrying passengers, to be provided with all the appliances and be subject to all the strict rules of those which do carry passengers, while at the same time the ferry boats running between this city and the adjacent cities are exempted from the claims of that law. That is, steamboats which carry no passengers are obliged by the law to be provided with all the means of safety for saving passengers' lives, while steamboats that carry more passengers in a week than all the steamboats running up and down the Hudson river, in a year, are not obliged to be provided with such means for the preservation of life. The ferry boats running between Brooklyn, Williamsburgh, Jersey City, and this city, are sometimes literally crowded with passengers. If one of them so crowded was struck, and so damaged as to sink in a few minutes, nearly every soul on board would be drowned, at least this might be expected, on account of the absence of all life-preserving apparatus for their rescue. Two months ago one of the Williamsburgh boats was struck when crowded with passengers, and she had only time to run into the main dock—from which she was but a short distance—then run down to a side dock, when she sunk. Had she been struck in the middle of the river opposite the Navy Yard, it is very likely that two or three hundred persons would have been drowned. The law should be so amended as to make every ferry boat more secure against such accidents. Thus every seat might easily be made a life-preserver by making it hollow and air tight. Every cushion might also be made a life preserver by making it of granulated cork, covered with any suitable material. There are various other things for the safety of life which might be suggested.

### American Association for the Promotion of Science.

The eighth regular session of the American Association for the Promotion of Science will convene in Washington at the Smithsonian Institution, on the last Monday of the present month. The officers for this meeting are Prof. J. D. Dana, of New Haven, President; Prof. Lovering, of Cambridge, General Secretary; Dr. J. Lawrence Smith, of Washington, Permanent Secretary. It is understood that at the meeting, the Association will be, to a considerable extent, remodeled and reorganized, so as to render it more efficient and active. It is not impossible that a code of scientific ethics for the government of those engaged in scientific pursuits and publications, and for the suppression of charlatanry, will be adopted. A general session of the Association has also been allotted for the discussion of the subject of weights and measures, with a view of leading to some uniformity of system, both in this country and abroad.

Reports on the following subjects will also be made by the following gentlemen: On the Tidal Investigation of the Coast Survey, by Prof. Bache; on Atmospheric Electricity, by Prof. Henry; on the recent additions to our knowledge of the Paleogoic Rocks, by Prof. Jos. Hall; on Micro-chemistry, by Dr. J. L. Smith; on the recent progress of Organic Chemistry, by Prof. Wolcott Gibbs; on the Progress and Developement of the Electro-chronographical Method of Observation, by Dr. B. A. Gould; on the Remains of Extinct Mammalia and Reptilia of North America, by Prof. Leidy; on Planetary Perturbations, by Prof. Peirce; on the recent advances in Anatomy and Physiology, by Dr. F. W. Burnett; on the Alternation of Generation, by Prof. Agassiz; on the Geographical Distribution of the Lower Animals, by Prof. Dana.

Several other topics of interest will also be brought before this Association, and among others, we understand, the celebrated poisoning case of Hendrickson, of Albany (decided last August), will be introduced by some of our leading chemists, with a view of exposing the character of the testimony given as scientific evidence.

The meeting will undoubtedly be well attended and highly interesting.

### American Nautical Science.

The quickest passage ever made from Liverpool to the Cape of Good Hope, was accomplished by the American steamship "Golden Age," commanded by D. D. Porter, Lieutenant, U. S. N. The time occupied was twenty six days, about eight days less than that of any British steamer. This was done under great disadvantages so far as her steam power was employed, for owing to a heavy cargo, coal for only twenty days steaming was laid in. Four of the furnaces were shut off, and only thirty-five tons of coal were consumed per day, and yet it made on an average 244 miles every twenty four hours.

In a letter addressed from the Cape of Good Hope, to Lieutenant Maury, commander Porter attributes his astonishing passage to consulting the wind and current charts. He says:—"I send you a little sketch of our course, which will show you at a glance the route I took. In studying your wind and current charts, I found there was a region, by crossing in 3 or 4 deg. west longitude, where I would find steady S. W. winds, and another in east longitude, where I would find calms. I also surmised that, by running along the African coast, (without deviating too much from my direct course,) I would find an eddy current setting to the southeast. It turned out as I anticipated, and proved to my entire satisfaction that this was the true route for a paddle-wheel steamer, either from England or the United States. A fast steamer can make the run in twenty-three days from England, and thirty-three from the United States; and if a coal depot could be established at Goree on the coast of Africa, the distance from England would be shortened 300 miles. All the side-wheel steamers that have gone out have made the passage partly under sail; whereas, by taking the in-shore track, they would have made it in half the time with steam alone. I am pleased that we have solved the difficulty, and I am indebted entirely for my success to the hints I took from your wind and current chart. It is as useful for steamers as it is for sailing vessels. I have been most agreeably surprised in not finding strong currents against me; indeed, since crossing the line, the current has been little or nothing, and mostly with us twelve or fourteen miles day."

The above steamer was built in this city, and took a cargo to Liverpool, from which place she sailed for Australia, to form one of the American mail line between that country and California.

### The "Ericsson."

"The caloric ship 'Ericsson,' will have her new and improved engines completed in about ten days, when she will make a trial trip, and is confidently expected to proceed to sea without further delay."

The above we copy from the "Courier and Enquirer" of April 7th. We hope their expectation concerning the "Ericsson," may now be realized, it is certainly time for something to be done.

### Convention of Shipbuilders.

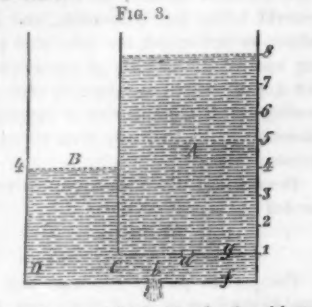
A large convention of shipbuilders was held in Bath, Me., on the 5th inst, for the purpose of taking measures to effect a change in the laws of tunnage. They passed a series of resolutions asking the co-operation of the shipbuilders of New York and other places, to join with them in a repeal of the present law of ship-measurement.

### Water Wheels---The Turbine---Article 2.

[Concluded from page 238.]

THE CONSTRUCTION OF THE MACHINE.—23. Figure 3 is intended to show that water when issuing at two apertures, as at *a* and *b*, will have a velocity at each equal to that due one half the head.

FIG. 3.

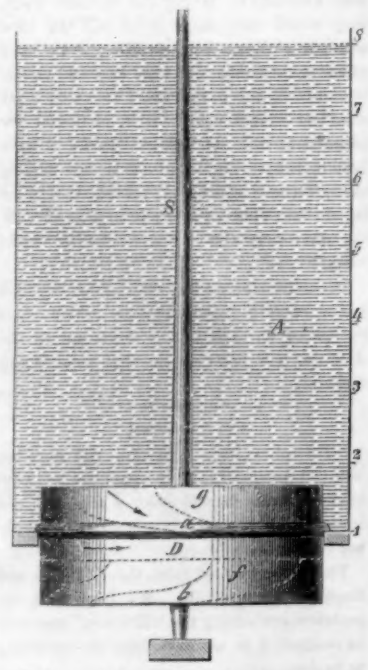



A is a cistern eight feet in depth, with two bottoms, *g*, and *f*, each of which have an aperture, *a* and *b*, of equal size. B is a cistern attached to A, with a communication at *c*, and an outlet at D. If A be filled with water to 5, equal 4 feet above the bottom *g*, and C and D be open, the water will escape at *a*, with a velocity of 16 feet per second. If D be closed, and the cistern A, kept full of water to *g*, the water in B will rise to 4, and the velocity at each aperture will equal 16 feet per second.—For the perpendicular highth of the water above *b*, is 4 feet, and the difference in perpendicular highth of the surface of the water in A and B, is 4 feet; consequently, by arts. 9, 10 and 11, the pressure on each bottom will equal a column of water 4 feet in highth, and the velocity at each aperture will equal that due at *a* 4 feet head.

As the water does not move in either direction at C, if this communication should be closed it will not affect the velocity at the jets, *a* and *b*, nor the pressure on the bottom *g* and *f*, and if the vessel B, should be entirely removed, the pressure on the bottoms and velocity at the jets would not be raised. Therefore, if water pass through an aperture into a close apartment, from which it issues again at a similar aperture; the velocity at each aperture will equal that due one half the whole head, and the pressure in the apartment will equal the weight of half the head.

24. By making a circular space in the bottom, *g*, and moving the bottom, *f*, fig. 3, a turbine wheel may be placed in it, with guides and shaft arranged as in fig. 4. The cistern, A, is, in section; the turbine guides and shaft are in elevation.

FIG. 4.

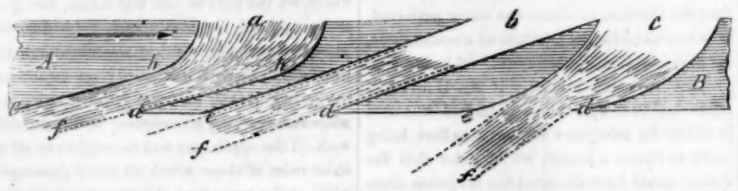



In fig. 4, A is a cistern 8 feet in depth, *f*, is a turbine wheel, *g* the stationary guides placed over it; *a* is the lower part of one of the guides, *b* an issue of the wheel, and S, the shaft. The dotted lines show the form and position of the guides and buckets. The dart in the space D, between the guides and wheel, indicates the direction of the water.

From what was said above art. 23, when A is filled with water up to *g*, the water will issue through the guides, *a*, into the space D, between them and the wheel, and issue out at *b*, of the wheel *f*, with a velocity at each equal to that due one half the head, 16 feet per second; and the pressure in the space, D, will equal that of, a column of water the highth of half the head, 4 feet. When the turbine, *f*, is moving in the direction of the arrow with a velocity equal that of the water in the space D, 16 ft. per sec., by art. 20, the water will act on the turbine, tending to impell it forward, as it would do if it was at rest, and the water in A lowered down to 4, four feet above the lower part of the turbine, and the guides removed. Here we have the principles of the machine, fig. 3, carried out in a practical way. The cistern A, with guides, *g*, represents B, fig. 3, with issue *a*; and the turbine *f*, with space D, and issues *b*, represents the vessel A, with issue *b*, and the same reasoning made use of in reference to fig. 3, will apply to fig 4.

25. The experimental coefficient, *n*, art. 18, will now be discussed. A corollary deduced from the parallelogram of forces, is, that the intensity of a force tending to impel a body which can move in one direction only, is to the direct intensity of that force, as the cosine of the angle formed by the direction of its action

FIG. 5.




and the line of motion is to the radius. An inspection of fig. 4, and the diagram, fig. 5, will show, that the water issues at an angle to the plane of rotation of the wheel: and that, by arts. 2 and 15, the force of pressure, or reaction is in the direction *f d*, and not that of *e d*; consequently, the intensity of the force, in the direction *e d*, will be to that in the direction *f d*, as the cosine of the angle *f d e* is to the radius. By effecting the formula, art. 18, with this quantity, we obtain, $\cos^2. = n$; whence $E = n(m+g(c-w+v)w)$.

The friction of the water on the machine, and various other causes, will diminish the velocity of the issuing water below that due the highth of head, which will further reduce the effect.—When this originates from the friction of the water alone, which can only be determined by experiment, it may be neglected, as one of the data on which the calculation is based is the velocity of the water. But when the diminution takes place in consequence of bad construction, it should be taken account of in comparing the efficiency of different machines.

26. Fig. 5 is a diagram intended to illustrate the difference in efficiency of wheel with different kinds of issues. A B represents part of a section of a wheel, with the different forms of issue, *a*, *b*, and *c*, discharging equal quantities of water, and each occupying an equal space of the wheel, A B, the lower points of the guides, *e* and *d*, being equally distant from each other.

The form of issue at *c* is extensively used, and until quite recently was almost the only kind in use in re-action wheels. A mistaken notion in relation to this form of guide is very generally entertained. It is supposed that as the bottom of the guide at *d* curves to nearly a horizontal position, the water will leave it nearly horizontally: but the water will leave it in that direction which will admit of the greatest discharge; and the greatest width of the issue being in the direction *d f*, this will be the direction of the effluent water.

The angle *f d e*, issue *c*, is 30°, the cosine of which is ·866, the radius being 1. And by art. 25, $\cos^2. = n = ·75$. One-fourth of the effect is lost by an oblique action of the water equal to 30°.

The issue *b* is seldom used. The angle *f d e* is 18°, the $\cos^2. = ·90$, only one tenth lost.—But from art. 14, the velocity of the water, on account of bad adjutage, will be ·8, that due the head; hence, $n = ·576$. Over 42 per cent lost.

The form of issue represented at *a* is one for which a patent was obtained in 1847. The guides are formed with a view to letting the water escape with the greatest possible velocity, and with the least angle possible to the plane of rotation, or tangent of the wheel. The part of the guide *d h* is a plane, from *h* upwards is cycloidal, *h* being the cusp of the cycloid.

The angle *f d e*, issue *a*, is 15°, which gives cos. = ·933. Hence, $n = ·933$. Not quite 7 per cent lost.

27. By effecting the equation, art 18, with *n*, we will obtain $E = \frac{(v-w+gv)wmn}{g}$.

The practical rule for determining the effect deduced from this equation, may be expressed in words as follows:

RULE—To the velocity with which the water enters the wheel, add that of the effluent water, less that of the wheel; multiply this sum by the velocity of the wheel, and by the weight of water that escapes per second, and again by the square of the cosine of the angle of deflection of the water from the plane of rotation or tangent of the wheel; and divide the product by the velocity acquired by falling one second, (32) and the quotient will be the effect per second.

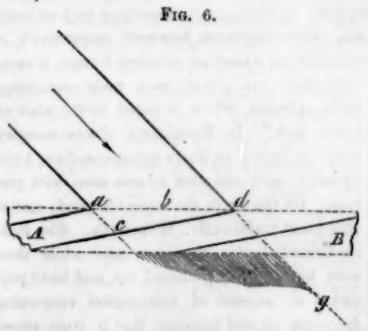
THE VELOCITY OF THE WHEEL—28. One feature in the action of the turbine deserves further notice. Practical men have remarked that the turbine revolves oftener, under similar circumstances, than other wheels do; and those acquainted with hydrodynamics have observed that they move faster than the water which propels them; yet writers seem to doubt the fact. "How is this?" they ask; "if the wheel out-runs the water, where does it get its power from?"

It was demonstrated in article 22, that, to produce a maximum effect, the wheel should move just as fast as the water issued; and it was further shown that when the wheel moves one half faster than the water issues, the effect would be diminished only 25 per cent. While the water issues with a velocity of 16 feet per second, the periphery of the wheel will move with a velocity of 24 feet per second. Thus the observations of practical men are verified by scientific investigation.

There is, however, another principle of action brought to bear on the turbine wheel in most cases, causing it to revolve faster than the water. By this principle, although it may appear paradoxical to some, a wheel may be made to revolve several times as fast as the water issues, and to discharge two or three times the quantity of water that is due the size of the issues and highth of the head.

It is this principle that enables vessels to sail laterally to the direction of the wind, and causes the sails of windmills to move faster than the wind does which impels them. As applied to water wheels it may be illustrated by a figure, thus,

FIG. 6.




Let C represent a portion of a flume, or chute of water, and A B a portion of a wheel with plain thin guides. Let the distance from the top of the guide at *a* to *c*, be only one-fourth the distance from *a* to *d*. Then, if the wheel move with such velocity, in the direction from *a* to *d*, that while the water will move from *a* to *c*, the top of the bucket at a will move to *d*, the wheel will move with four times the velocity due the head of water. Moreover the water will not be impeded by the wheel, but will pass on towards *g* with a velocity equal to that with which it would move were the wheel removed. But should the wheel be so obstructed that the top of the guide at *a* would only reach *b*, half way to *d*, while the water from under the head would reach from *a* to *c*, the water will then be deflected by the guides, and will impel the wheel forward with a certain force, although the wheel is moving twice as fast as the water would issue from under the head.

Deducing a coefficient of effect for this machine is quite complex, involving problems in trigonometry, but as the water acts by deflection, and does not lose its velocity in passing through the wheel, the percentage of the power realized is not great.

This principle is brought to bear in a greater or less degree, on all turbine wheels which have the inlet larger than the outlet, or that move faster than the water enters; increasing their velocity, but diminishing the effect.

Hally or some astronomer, investigated the orbit of a comet, predicting its return at a certain time. But it did not appear as predicted. On reviewing the investigation, he found the influence of the planets had been neglected, and that the great planet Jupiter had entirely changed its orbit. He then predicted its return with considerable exactness. Astronomers knew that the planets would influence the motion of bodies, but had not thought of this when investigating the orbits and motion of comets.

Thus it is with those who have attempted an investigation of the action of water on turbine wheels—well known principles which govern their action are left out of the matter, and the consequence is a failure.

JAMES B. CONGER.

Jackson, Tenn.

### Seedless Apples.

MESSRS. EDITORS.—In a late number of the 'Scientific American," I saw it stated that if the top of an apple tree was planted in the ground it would produce an apple without any core. On seeing the statement it brought to my recollection once hearing of a French gentleman, one of my neighbors, (now deceased) having tried the experiment, I asked his son about it who gave me the following account:—"My father having seen the above statement in an old French work, set me and my brother to plant a tree which he had procured for the purpose, which we did, first planting it in the usual manner, then bending the top down and planting some oats in the pit; after it had taken root he sawed it in two; both parts of the tree bearing the same season. The flavor of the fruit of both parts was the same; the apples on the top part were smaller than those near the root, and neither seed nor core being solid throughout. The tree bore two seasons, and was then destroyed by carelessness in plowing." The truth of the above is substantiated by a number of his neighbors, who saw the apples.

I have seen it asserted that a stoneless cherry may be produced in the same way. J. H.

Penn., April 2, 1854.

### Steamer Wm. Norris.

The undersigned having been intimately connected with the construction of this vessel, deems it due to himself that the following facts should be known:—

First. That by the agreement upon which the vessel was constructed, he incurred *no* financial responsibility.

Second. That for the model and plans developed in her construction, he alone is responsible, having designed them himself.

JOHN W. GRIFFITHS.

New York, March 29th, 1854.

Mr. Marth, assistant at Mr. Bishop's observatory, Regent's Park, London, has discovered, a new planet, close to the star Spica, in Virgo, evidently belonging to the group betweed Mars and Jupiter. It appears like a star of the tenth magnitude.

Mr. Samuel Owen, to whom Sweden owes the introduction of steamboats into that country, died at Stockholm lately, at the age of 80.

Wine has been made at Stafford, Connecticut, for several years past, from grapes that grow spontaneously in and around the swamps of that place.

### TO CORRESPONDENTS.

W. C. D., of Fla.—The only thing we can recommend you to do is to wear boots with gutta percha legs, and wash your feet and legs well every evening with warm vinegar and then in milk-warm water.

J. S. S., of Ohio—We cannot refer you to any publication which gives such information as you desire. We are not aware of Mr. Leonard having removed his machinery depot, and cannot tell why your letters have not been answered.

M. B., of Ohio—We do not fully comprehend the improvement which you describe in windows for ventilating buildings, and do not perceive that it has any advantages over the ordinary balanced sash commonly in use here. If you wish further advise you had better send us a model for examination.

G. T. P., of N. Y.—We cannot answer you in regard to Andrew's saw. The nut protector described in your letter, we do not regard as possessing any patentable novelty. It may be useful but not novel.

T. B. M., of Ill.—We have seen essentially the same apparatus for cutting grain, as is shown in your sketch, and cannot therefore regard it as patentable. We know of no work on the art of stuffing birds: arsenic, we know, is the chief preserving substance employed. We will present a few remarks on the subject in our next number.

C. G., of Texas—The fine varnish to which you refer is made by dissolving clean white lac in alcohol. The lacquer you speak of is made by adding some turmeric to this varnish and straining all through a clean cloth.

J. B. A., of N. C.—We certainly think that the wheel should always be made as simple as possible, and it appears to us that the main gate would be sufficient. If you know of any person who has used both the plans you speak of, he will be able to give you his experience. It appears to us that a device might be attached to the outer slides, to raise them promptly and easily. We are obliged to you for the information about saw mills.

W. J. W., of Ga.—We will try and present an article on the subject at an early date. Much depends in tempering metal on the skill of the eye, to know the exact heat for each article by its appearance in the fire.

W. W. D , of Mass.—Your cone tube for compressing the wind to act on the vanes, must be movable. The plan appears to be good.

D. R. S., of Ohio—We have seen two small boilers below, entirely surrounded by the fire and connected to a larger one above. The difference between yours and this plan consists in your having the two under boilers of the same size as the upper one.

O. W. O., of Mass.—The nitrate of silver is the base of common indellible inks, but if you mix india ink with a weak lye you will find it make a superior article. Your own judgment can enable you to find out the proportions; we have made it for ourselves, and never took the trouble of measuring the parts.

C. A., of N. Y.—Your question is exceedingly vague. We cannot tell the definite quantity of steam which should be used with coal in a fire to equal the moisture in wood. If you expel all the moisture from wood before it is used as fuel, you will find that it will not act on the boiler like anthracite coal. It is the intense concentrated heat of an anthracite fire that acts so injuriously upon the boiler.

Benj. Askew, Trenton, N. C., wishes to procure a good machine for sawing felces, carriage shafts, pillars, etc. The method of steaming wood in this region is similar to the one which you describe.

W. A. C., of Ct.—We do not know where the telegraph companies get their glass insulators.

E. B. R., of N. Y.—It will be better to wait until you receive your patent before a notice is made of your brake.

T. McG., of Ill.—Your regulating gates on the water wheel appear to be the same, as the one illustrated on page 105, Vol. 8. Sci. Am.

M. B. H., of Pa.—Your plan is not new; we have seen many plans for the same arrangement.

W. S. H., of N. Y.—You simply mean, if a pinion were geared with a cog-wheel on the shaft of a water wheel, instead of being geared to a cog rim on the circumference of the wheel, that the pinion would exercise as much power, though the velocity would be less. You are right; it cannot be otherwise.

F. W. E. of N. Y.—Tin roofs will leak if not well soldered, secured, and painted. They should be painted first with a thin coat of red lead, which should be suffered to dry: then with another coat of red lead mixed with dry clean sand, taking care to cover every part thoroughly. Such a roof we would prefer, but unless you secure it well at the sides, and keep it firmly down on the boards, we would advise you to put on a shingle roof. A slate roof is very dear, but if well put on, is no doubt the best of all. J. Dickson, of Albany, is the most experienced slater with whom we are acquainted.

D. K., of Ill.—You have not explained the use of your water vessel: you have only described an air engine, having a cylinder piston. We cannot see, from your sketch, how it is possible for it to work well. Without knowing something more about it, we could not answer your question about its being patentable.

C. E. W., of Md.—We do not conceive that it can make any difference where the regulator is placed on the gas pipe.

J. D., of Ohio—We do not think a small galvanic battery could be so well applied or answer as good a purpose as Maynard's Primer.

W. B. G., of Iowa—We have, in back volumes, fully explained how there was no loss by the crank: indeed, we have thrown such a mass of light upon the subject that no one need be in darkness.

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**Money received on account of Patent Office business for the week ending Saturday, April 7:—**

C. B., of N. Y., $30; A. H. C., of N. Y., $90; G. B. S., of N. Y., $15; U. B. V., of Pa., $20; J. W. H., of N. J., $30; J. B. S., of Wis., $25; E. A., of Ct., $30; W. McC., of N. Y., $30; J. S., of N. C., $60; W. G., of N. Y., $55; G. E. H., of N. Y., $30; J. H., of N. Y., $250; H. & P., of R. I. $30; D. D., of N. Y., $10; A. T., of N. Y., $30; C. B., of N. Y., $50; E. W., of N. Y., $20; W. B. L., of N. Y., $10; T. G., W., of N. Y., $27.

**Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, April 7:—**

C. B., of N. Y.; E. W., of N. Y.; J. B., S., of Wis.; D. D., of N. Y.; U. B. V., of Pa.; C. F. P., of Ct.; G. L., of Pa.; W. B. L. of N. Y.; E. W., of N. Y.; H. & P., of R. I.; S. M., of N. Y.; W. W., of Ill.; T. G. W., of N. Y.



UNITED STATES PATENT OFFICE,
Washington, March 14, 1854.

**ON THE PETITION** of Willard Dalrymple, executor of Samuel Sawyer, late of Boston, Massachusetts, deceased, praying for the extension of a patent granted to the said Samuel Sawyer on the 10th of June, 1840, for an improvement in machine for cutting corks, for seven years from the expiration of said patent, which takes place on the tenth day of June, eighteen hundred and fifty-four, (1854)—

It is ordered that the said petition be heard at the Patent Office on Monday, the 29th of May next, at 12 o'clock, m.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing. All testimony filed by either party, to be used at the said hearing, must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 19th of May; depositions and other papers relied upon as testimony, must be filed in the office on or before the morning of the 20th May; the argument, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Evening Argus, Philadelphia, Pa.; Scientific American, New York; Post, Boston, Mass.; and Inquirer, Cincinnati, Ohio, once a week for three successive weeks previous to the 29th day of May next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S—Editors of the above papers will please copy, and send their bills to the Patent Office, with a paper containing this notice. 29 3

# Scientific Museum.

[For the Scientific American.]

**Light and the Eyes.**

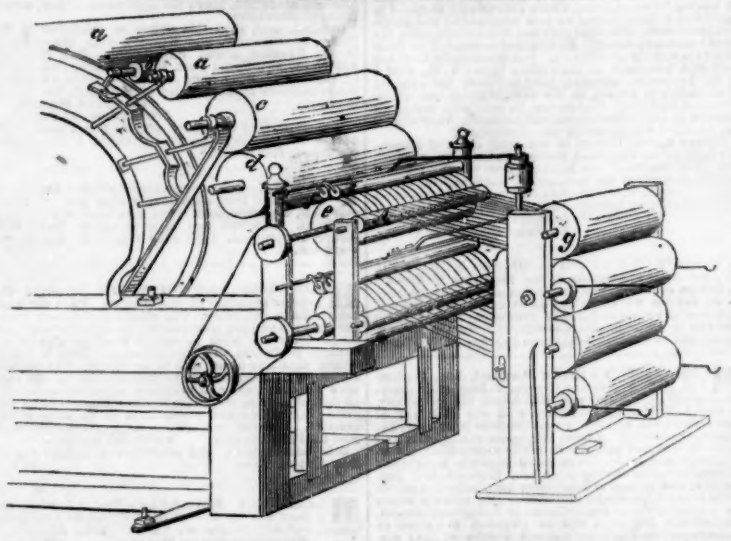
A few hints in addition to what were given by "Yankee Creole" in a late number of the "Scientific American," may be of some practical value to your readers. I am frequently called upon by persons having weak eyes for a remedy, and in a large majority of cases, especially those residing in the city, I have become convinced that nothing was required but a change in their method of using artificial light, and have advised them accordingly, and frequently seen the good results of the change. I will state what I suppose to be the manner in which eyes may be weakened by either natural or artificial light. Direct rays of light from any luminous object are usually painful to the eye, and consequently weakening by over stimulation of the optic nerve. Reflected light, unless from a polished surface, is seldom painful or weakening to the eye, when the person is looking at the object which reflects the light. When a person is looking for a considerable time in one direction, a ray coming from a reflecting body, other than that to which the eye is directed, and entering the eye obliquely, causes a greater or less uneasiness or pain, according to its intensity; a light placed over or behind and several feet from the head must necessarily be very bright or intense, in order to sufficiently illuminate a book for reading, or cloth for sewing; the room is thus highly lighted, and white or light colored walls or objects in the room cause a large amount of light to enter the eye obliquely, causing uneasiness, pain, and great fatigue after an hour or two, resulting in irritation, and establishing a permanent weakness of the eyes. A light placed so that direct rays enter the eye obliquely soon becomes painful, as for instance a candle, or lamp standing on a table in front of one who is reading. We instinctively prevent the rays of the sun entering the eye obliquely by placing some object as the hand, brim of the hat, or the parasol, so as to intercept them. The persons whose eyes are most weakened by artificial light are book-keepers, and others who read and write, or those who sew in the evening; the difficulty may be explained as follows:—When the eye is directed to an object, the iris adjusts the diameter of the pupil according to the amount of light coming from the object. The muscles of the eyeball also adjust the form of the eye, so that the retina or optic nerve shall be at the right focal distance from the front of the eye to receive the perfect image of the object. If the person is examining a dark object, the pupil is dilated, and cannot exclude a side or oblique light, and other objects than the one he desires to examine are pictured upon a part of the nerve that is not prepared to receive or notice them; in short, the eyes are prepared to notice but one object minutely at once, and being obliged to receive light from others at different distances, the eye is burdened or over-taxed, and its powers weakened. The remedy then consists in excluding the side or oblique rays. Those who have good sight and yet are obliged, from the nature of their employment, to use artificial light during long evenings, as well as those whose eyes are already weakened, must adopt the following if they would retain or recover the perfect use of this most invaluable function:

The object—as the paper, book or work, must be sufficiently illuminated to be seen distinctly, and every object about the desk, table or room, that is white or light colored, and in such position that its reflected light can reach the eye, must be removed or darkened. If the person is writing, all papers except the one upon which he is writing should be removed. The light under such circumstances may be at any convenient place. If it is placed back of the head no shade is necessary, but if in front of the head a dark shade should be placed between the eyes and the light. The table or desk should be dark and not polished. Economy as to the expense of the light would require it to be placed as near as possible to the book or paper, the light diminishing according to the square of the distance. Consequently a very small burner near the paper will illuminate it as much as a large burner over or back of the head. Persons with large and prominent eye-balls suffer most from the causes mentioned, and find great relief from shading their eyes. Fashionable ladies who protect only the back part of their head with the bonnet are greatly troubled when out of doors by the sun's light—weak eyes are the result. Much may be written upon this subject.

An Ear Instrument.—In regard to the ear instruments mentioned in a former number, I will say that they are of no possible advantage to hearing or the cure of deafness; this difficulty can only be caused by organic derangement of the ear, or functional derangement of the auditory nerve, and a short bit of silver tube placed in the passage of the ear cannot affect the internal ear, and by obstructing the passage it becomes a detriment, yet numbers of them have been sold to the credulous at a high price.

R. F. Stevens, Oculist and Aurist.
Syracuse, N. Y.

## IMPROVED WOOLEN CONDENSER.




The annexed engraving is a perspective view of an improvement on Woolen Condensers, for which a patent was granted to James S. Hogeland, of Layfayette, Indiana, on the 18th of January, last year. This improvement relates to woolen condensers of the reciprocating variety, as exhibited in the figure. The slubbing or roping, as it comes from the card, is compressed lightly upon the surface of the rub-roller, by the reciprocating rollers above. So that it often happens that the roping adheres to the rub-roller with sufficient force to be drawn round by it until broken away from the spool, which not only renders it necessary to stop the machine to mend the brake, but also causes a frequent waste of the adjoining slubbings by the entanglement of them by the broken one.—The object of this invention (or improvement) is to remedy these defects, and consists in the employment of relief and guide rollers, which are so situated and rotated on the delivering side of the ordinary rub-rollers as to relieve the slubbing from its tendency to adhere to the latter, and be carried out of the direct line to the spool. Another great advantage gained by the relief roller, is in its keeping the roping in its proper course to the spools when the wool is filled with electricity, which all those who work in wool know is very difficult to overcome, especially in frosty weather.

In the figure, *a a* are the workers, and *b* the strippers of the ordinary condenser. *c* is the usual fancy roller, and *d* the upper doffer for taking off the slubbing therefrom; *e* is the rub-roller on which the wool, in passing over, is condensed by the reciprocating movement and rotary action of the vibratory rollers, *f*, in the usual manner; *g* is the spool for receiving the roping as it is discharged from the rub-roller. Such description, so far refers to the ordinary mechanism in use for condensing wool, and it will be unnecessary to describe the further action of these parts. Two or more rub-rollers, as represented in the engraving, with their accompanying parts, are fitted to the same frame, if desired, for duplicates or separate condensing, but as each rub-roller has the improvement applied, it is only described as connected with one. With coarse or burry wool, the direct transmission of the slubbing or roping from the rub-rollers to the spools is often impeded by the unequal adherence of the wool to the rub-roller, which, in rotating, is apt to carry the coarser or more burry or gummy adhering roping round with it, or partly so, by drawing the same out of its direct course, thus unequally deflecting the roping in its course to the spool; it is therefore unequally drawn and wound upon the spool irregularly, and when much inequality in the draw occurs, the folds of the roping are in danger of becoming entangled on the spool. The sticking of the roping to the rub-roller also frequently produces further difficulty by causing the roping to wind round the rub-roller instead of the spool. To obviate these evils, the condenser is furnished with a small relief roller, A, which is revolved in the same direction as the rub-roller and nearly in contact therewith on its delivery side, and thus it will be seen the tendency of the roping to adhere to the rub-roller, will be counteracted by the action of the relief roller, to which it has but little if any tendency to stick, as it is not compressed on it, as upon the surface of the rub-roller, by the pressure of the rubbers, the roping or slubbing, therefore, will be continued in a direct line, or nearly so, from the upper portion of the periphery of the relief roller to the spool. This relief roller may be driven by the same belt or band that communicates motion from the rub-roller to the spool drum, or it may be driven in the same direction as the rub-roller by any suitable means. Each rub-roller of the condenser is furnished with a relief and guide roller. Mr. Hogeland says he has now had it, in constant use, eighteen months, with full satisfaction, from the fact, that it enables him, with the same machinery, with no other alteration save the relief roller, to do twenty per cent. more work than he could before or without it.

More information respecting it may be obtained by letter addressed to the patentee, at Lafayette, as above mentioned.

**A Country of Pests.**

Dr. Hooker, in the course of his "Himalayan Journals," just published, gives the following sketch of a pleasant excursion on the Nepaulese Himalaya: "Leeches swarmed in incredible profusion in the streams and damp grass, and among the bushes; they got into my hair, hung on my eyelids, and crawled up my legs and down by my back. I repeatedly took upwards of a hundred from my legs where the small ones used to collect in clusters on the instep; the sores which they produced were not healed for five months afterwards, and I retain the scars to the present day.

Another pest is a small midge, or sand-fly, which causes intolerable itching and subsequent irritation, and is in this respect the most insufferable torment in Sikkim; the minutest rent in one's clothes is detected by the acute senses of this insatiable blood-sucker, which is itself so small as to be barely visible without a microscope. We daily arrived at our campaigning ground streaming with blood, and mottled with the bites of peepsas, gnats, midges, and musquitos, besides being infested with ticks."

**Employment of a Diving Bell.**

A diving bell has been sent from this city to be used in examining the bed of the Susquehanna River, for the purpose of selecting the best site for the railroad bridge, which is to dispense with the ferry that has so long formed the subject of annoyance to the traveling community between Baltimore and Philadelphia. A similar bell is in progress of construction by Messrs. Hollingsworth, Harvey & Co., of Wilmington, Del., which is designed to be used in the actual construction of the piers for the bridge.

**Time required to Eat.**

In one of our daily papers last week, we saw a rule laid down for eating, which deserves attention. It consists in masticating the food well, not eating too much, and taking *one hour* to a meal. We conceive that the author of that advice was laying out work for the dentists by advising people to grind down their teeth. It must be a terrific dinner which requires an hour to masticate and swallow.

The King of Sweden has presented a gold medal to Lieut. Maury, as a token of his esteem for the benefits he has conferred upon all nations by his discoveries.

## LITERARY NOTICES.

The National Magazine—Devoted to Literature, Art, and Religion. Edited by Abel Stevens; Carlton & Phillips, publishers, No. 200 Mulberry street, N. Y. This very excellent magazine has now reached its fourth volume, and has, as we understand, already reached an extensive circulation. It is really a very well edited and interesting monthly, not a whit behind others which boast much higher of their claims to public favor. The illustrations in the "National Magazine" are very fine, and the mechanical execution is excellent. Price of each number 18 3-4 cts.

Book of the World—No. 7, Vol. 2, of this interesting miscellany, is just from the press of John Weik, late Weik & Wieck, of Philadelphia. The steel engraving which illustrates this month's number is a bird's-eye view of New York city and Brooklyn, and no resident here, can but recognise the truthfulness of the picture, notwithstanding the diminutive scale upon which it is taken. Other beautifully colored engravings illustrative of subjects in the animal kingdom embellish its pages.

Putnam's Monthly—G. P. Putnam & Co., publishers, New York. The April number of this "excelsior" of American monthlies, has been placed upon our table.

American Railway Guide—Dinsmore & Co., publishers, No. 9 Spruce street. The April number of this agreeable traveller's companion is issued, and we consider it one of the most useful serials that is published. No one can travel pleasantly without one of these Guides for a companion.

Littell's Living Age—Commenced a new volume last week. The publishers have opened an office in this city at No. 243 Broadway.